

## CLAIMS

We claim:

1. An elevator system, comprising:

a cab that is supported for movement within a hoistway;

- 5 at least one load bearing member having a first portion secured near a first end of the hoistway, the load bearing member being arranged within the system such that the load bearing member extends from the first end of the hoistway toward the cab, wraps at least partially around a first sheave supported for movement with the cab, extends from the first sheave toward the first end of the hoistway, wraps at least  
10 partially around a second sheave supported near the first end of the hoistway, extends from the second sheave toward a second end of the hoistway, wraps at least partially about a third sheave supported near the second end of the hoistway, extends toward the cab from the third sheave, wraps at least partially around a fourth sheave supported for movement with the cab, and extends from the fourth sheave toward the  
15 second end of the hoistway; and

a tension device near the second end the hoistway that secures a second portion of the load bearing member near the second end of the hoistway and maintains tension on the load bearing member throughout all movement of the cab within the hoistway.

20

2. The system of claim 1, including a machine that causes movement of the load bearing member about the sheaves to achieve a desired movement of the cab.

25

3. The system of claim 2, wherein the machine is supported near the first end of the hoistway.

4. The system of claim 2, wherein the machine is associated with at least one of the first, second, third or fourth sheaves such that the sheave associated with the motor is a traction sheave in the system.

30

5. The system of claim 2, including a traction sheave associated with the motor and at least one deflector sheave and wherein the traction sheave and the deflector sheave contact the load bearing member between two of the first, second, third and  
5 fourth sheaves.
6. The system of claim 1, wherein the tension device comprises a mass that remains near the second end of the hoistway.
- 10 7. The system of claim 6, including at least one guide member positioned to guide limited movement of the mass.
8. The system of claim 6, wherein the cab has a cab weight and is adapted to carry a duty load weight and wherein the mass has a weight that is at least equal to  
15 one-half of the sum of the cab weight and the duty load weight.
9. The system of claim 6, wherein the mass comprises a plurality of portions secured together.
- 20 10. The system of claim 6, wherein the mass comprises a shell at least partially filled with a selected material.
11. The system of claim 1, wherein the tension device comprises at least one spring.  
25
12. The system of claim 1, wherein the tension device comprises at least one pressurized actuator.

13. The system of claim 1, wherein the tension device comprises a lever member having one end that is supported to pivot relative to a portion of the hoistway and a second end secured to a tension member of the tension device and wherein the load
- 5 bearing member is secured to the lever member at a selected location between the first and second lever ends.

14. A method of installing an elevator system having a cab, a plurality of sheaves, a load bearing member that moves about the sheaves to cause a desired movement of the cab and a tension device that remains essentially stationary while the cab moves, comprising the steps of:

- 5 (A) establishing a top support at a desired height in a hoistway;  
(B) securing a first portion of the load bearing member to the top support;  
(C) supporting a plurality of sheaves at desired locations in the system;  
(D) winding the load bearing member about the sheaves in a desired pattern;

- 10 (E) securing a second portion of the load bearing member to the tension device such that a first section of the load bearing member extends between the first portion and the second portion, the first section having a length that is less than the total length of the load bearing member;

- (F) using the elevator system to move the cab within the hoistway between  
15 locations below the desired height;

- (G) subsequently releasing the second portion of the load bearing member from the tension device;

- (H) raising the top support to a second, higher height in the hoistway; and

- (I) securing a third portion of the load bearing member to the tension  
20 device such that a second section of the load bearing member extends between the first portion and the third portion, the second section having a length that is greater than the length of the first section.

15. The method of claim 14, including subsequently releasing the third portion of  
25 the load bearing member from the tension device;

raising the top support to a third height in the hoistway that is higher than the second height; and

- securing a fourth portion of the load bearing member to the tension device such that a third section of the load bearing member extends between the first portion  
30 and the fourth portion, the third section having a length that is greater than the length of the second section.

16. The method of claim 14, including using the elevator system to move the cab within the hoistway between locations below the second height subsequent to performing steps (H) and (I).

5 17. The method of claim 14, wherein step (C) includes positioning a first sheave for movement with the cab, positioning a second sheave near the top support, positioning a third sheave near an end of the hoistway, positioning a fourth sheave for movement with the cab.

10 18. The method of claim 17, wherein step (D) includes placing the load bearing member such that the load bearing member extends from the top support toward the cab, wraps at least partially around the first sheave, extends from the first sheave toward the top support, wraps at least partially around the second sheave, extends from the second sheave toward the third sheave and wraps at least partially about the  
15 third sheave, extends toward the cab from the third sheave, wraps at least partially around the fourth sheave, and extends from the fourth sheave toward the tension device.